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SOIL GAS SURVEY OPERABLE UNIT 1 (OU1) NAS JACKSONVILLE FL

3/1/1992

TARGET ENVIRONMENTAL SERVICES, INC

NAVAL INSTALLATION RESTORATION PROGRAM

SOIL GAS SURVEY - OU1

NAVAL AIR STATION

JACKSONVILLE, FLORIDA

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SOIL GAS SURVEY - OU1

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JACKSONVILLE, FLORIDA

PREPARED FOR

ABB ENVIRONMENTAL SERVICES

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EXECUTIVE SUMMARY

On February 25 and 26, 1992, **TARGET Environmental Services, Inc. (TARGET)** conducted a soil gas survey for the **Navy Installation Restoration Program** at the **Naval Air Station** in Jacksonville, Florida. A total of 60 soil gas samples were collected and analyzed by GC/FID for petroleum hydrocarbons and GC/ECD for chlorinated hydrocarbons. Eleven (11) permanent soil vapor probes were installed at the site to allow for the collection of future soil gas samples without subsurface penetration.

Relatively low levels of Total FID Volatiles were present over much of the site. The GC/FID chromatogram signatures of the samples revealed late eluting peaks which may represent terpenes. Terpenes are naturally occurring hydrocarbons exuded by plant roots.

Methylene chloride (CH_2Cl_2), trichloroethene (TCE), and tetrachloroethene (PCE) were below their respective detection limits in all the samples collected at the site. 1,1,1-Tetrachloroethane (1,1,1-TCA) was present at a relatively low level in Sample SG034 collected in the residential area east of Madfox Drive. 1,1,1-TCA is a commonly used industrial solvent and a byproduct in biodegradation of other compounds.

The remaining hydrocarbons observed in the Oil and Solvents Disposal Pit Area and the adjacent residential housing area may be naturally occurring and do not suggest a contamination problem in the shallow subsurface of this area. This survey constitutes a baseline for future analysis of samples from the permanent soil vapor probes implanted at the site.

Introduction

ABB Environmental Services contracted **TARGET Environmental Services, Inc. (TARGET)** to perform a soil gas survey for the **Navy Installation Restoration Program** at the **Naval Air Station** located in Jacksonville, Florida. The purpose of the survey was to evaluate the potential for contaminant transport and human exposure via soil gas migration through the vadose zone. The survey area included the Oil and Solvents Disposal Pit Area and the adjacent residential housing area east of Operable Unit 1 (OU1). Soil and ground water information was not reported. The field phase of the soil gas survey was conducted on February 25 and 26, 1992.

Detectability

The soil gas survey data presented in this report are the result of precise sampling and measurement of contaminant concentrations in the vadose zone. Analyte detection at a particular location is representative of vapor, dissolved, and/or liquid phase contamination at that location. The presence of detectable levels of target analytes in the vadose zone is dependent upon several factors, including the presence of vapor-phase hydrocarbons or dissolved or liquid concentrations adequate to facilitate volatilization into the unsaturated zone.

Terminology

In order to prevent misunderstanding of certain terms used in this report, the following clarifications are offered:

The term "feature" is used in reference to a discernible pattern in the contoured data. It denotes a contour form rather than a definite or separate chemical occurrence.

The term "occurrence" is used to indicate an area where chemical compounds are present in sufficient concentrations to be detected by the analysis of soil vapors. The term is not indicative of any specific mode of occurrence (vapor, dissolved, etc.), and does not necessarily indicate or suggest the presence of "free product" or "phase-separated hydrocarbons."

The term "anomaly" refers to an area where hydrocarbons were measured in excess of what would normally be considered "natural" or "background" levels.

The term "analyte" refers to any of the hydrocarbons standardized for quantification in the chromatographic analysis.

The term "vadose zone" represents the unsaturated zone between the ground water table and the ground surface.

The term "indicates" is used when evidence dictates a unique conclusion. The term "suggests" is used when several explanations of certain evidence are possible, but one in particular seems more likely. As a result, "indicates" carries a higher degree of confidence in a conclusion than does "suggests."

The terms "elevated" and "significant" are used to describe concentrations of analytes which indicate the existence of a potential problem in the soil or ground water.

Field Procedures

Soil gas samples were collected at a total of 60 locations at the site, as shown in Figure 1. The sampling pattern was specified by **ABB Environmental Services.** To collect the samples a 1/2 inch hole was produced to a depth of approximately 5 feet by using a drive rod. Sampling depth varied due to shallow ground water, as shown in Table 1. Where pavement was present, a rotary hammer was employed for penetration prior to using the drive rod. The entire sampling system was purged with ambient air drawn through an organic vapor filter cartridge, and a stainless steel probe was inserted to the full depth of the hole and sealed off from the atmosphere. A sample of in-situ soil gas was then withdrawn through the probe and used to purge atmospheric air from the sampling system. A second sample of soil gas was withdrawn through the probe and encapsulated in a pre-evacuated glass vial at two atmospheres of pressure (15 psig). The self-sealing vial was detached from the sampling system, packaged, labeled, and stored for laboratory analysis.

Prior to the day's field activities all sampling equipment, slide hammer rods and probes were decontaminated by washing with soapy water and rinsing thoroughly. Internal surfaces were flushed dry using pre-purified nitrogen or filtered ambient air, and external surfaces were wiped clean using clean paper towels.

Field control samples were collected at the beginning of the day's field activities, after the twentieth soil gas sample, and at the end of the day's field activities. These QA/QC samples were obtained by inserting the probe tip into a tube flushed by a 20 psi

flow of pre-purified nitrogen and collecting in the same manner as described above.

Permanent soil vapor probes (SVPs) were installed by **TARGET** at Stations SG001 through SG011. Procedures for installation of SVPs are described herein. A 1-foot diameter by 3-inch deep hole was made using a shovel and then A-4 inch diameter by 8-inch deep hole was augured using a stainless steel auger. Following the auger, a 0.5 inch diameter manual drive rod was advanced down (as described in the soil gas sampling procedure) to a depth of 6 feet. A stainless steel SVP was then lowered to a depth of 5.5 feet unless inhibited by shallow ground water. Permanent probes SG008, SG009, SG0010 and SG011 were installed at depths of 3.5, 3, 1.75 and 2.25 feet, respectively. The augured hole was partially filled with surface soil to hold the SVP in place. The interior of the SVP was cleared of soil using a wire and sealed with a stainless steel cap. The outer excavation was filled with concrete and a well cover was installed over the probe, cemented in place approximately 1.5 feet above the ground surface and locked. Soil gas was sampled from the permanent probe locations on the day following their installation, as described above, to allow sufficient time for the concrete to cure.

The permanent probes were decontaminated prior to being transported to the site. The decontamination procedures, as specified by **ABB Environmental Services**, included rinsing with isopropyl alcohol. Prominent acetone/isopropyl peaks were present in the chromatogram signatures of soil gas collected at those locations. The volatile hydrocarbons reported in Samples SG001

through SG007, SG016 and Field Control Sample SG101 were determined to be caused by carryover in the sampling equipment following these decontamination procedures.

Laboratory Procedures

All of the samples collected during the field phase of the survey were subjected to dual analyses. One analysis was conducted according to EPA Method 601 (modified) on a gas chromatograph equipped with an electron capture detector (ECD), but using direct injection instead of purge and trap. Specific analytes standardized for this analysis were:

methylene chloride (CH_2Cl_2)
trichloroethene (TCE)
tetrachloroethene (PCE)

The chlorinated hydrocarbons in this suite were chosen because of their common usage in industrial solvents, and/or their degradational relationship to commonly used compounds.

The second analysis was conducted according to EPA Method 602 (modified) on a gas chromatograph equipped with a flame ionization detector (FID), but using direct injection instead of purge and trap. The analytes selected for standardization in this analysis were:

methy ethyl ketone (MEK)
ethyl acetate
methyl isobutyl ketone (MIBK)
n-butyl acetate
chlorobenzene
methyl tertiary butyl ether (MTBE)
benzene
toluene
ethylbenzene
meta- and para- xylene
ortho-xylene

These compounds were chosen because of their utility in evaluating the presence of fuel products, or petroleum based solvents.

The analytical equipment was calibrated using an instrument-response curve and injection of known concentrations of the above

standards. Retention times of the standards were used to identify the peaks in the chromatograms of the field samples and their response factors were used to calculate the analyte concentrations.

The Total FID Volatiles values were generated by summing the areas of all chromatogram peaks and calculated using the instrument response factor for toluene. Injection peaks, which also contain the light hydrocarbon methane, were excluded to avoid the skewing of the Total FID Volatiles values due to injection disturbances and biogenic methane. For samples with low hydrocarbon concentrations, the calculated Total FID Volatiles concentration is occasionally lower than the sum of the individual analytes. This is because the response factor used for the Total FID Volatiles calculation is a constant, whereas the individual analyte response factors are compound specific. It is important to understand that the Total FID Volatiles levels reported are relative, not absolute, values.

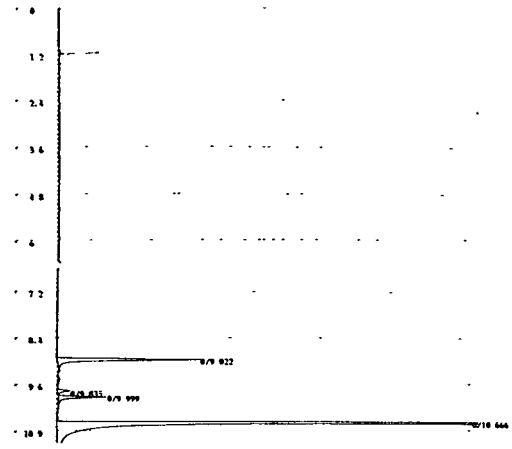
The tabulated results of the laboratory analyses of the soil gas samples are reported in micrograms per liter (μg/l) in Tables 2 and 3. Although "micrograms per liter" is equivalent to "parts per billion (v/v)" in water analyses, they are not equivalent in gas analyses, due to the difference in the mass of equal volumes of water and gas matrices. The xylenes concentrations reported in the table are the sum of the m- and p-xylene and o-xylene concentrations for each sample.

For QA/QC purposes, a duplicate analysis was performed on every tenth field sample. Laboratory blanks of nitrogen gas (99.999%) were also analyzed after every tenth field sample. Matrix spikes were not appropriate for soil gas analysis and were not performed on the samples in this survey.

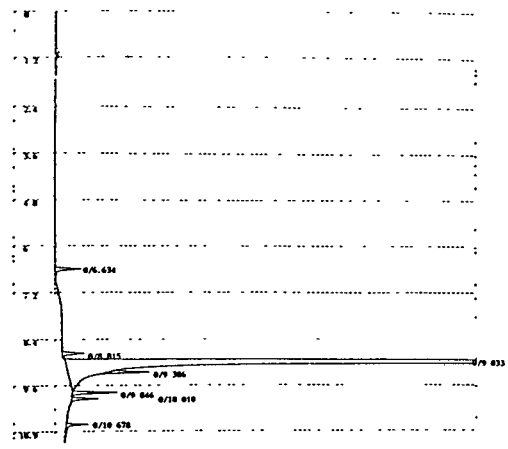
Discussion and Interpretation of Results

In order to provide graphic presentation of the results, individual data sets in Table 2 have been mapped and contoured to produce Figure 2. Map sample points with no data shown indicate that the analyte concentrations in the sample were below the detection limit.

Relatively low levels of Total FID Volatiles (Figure 2) were present over much of the site. None of the standardized FID analytes were present above the 1 μg/l detection limit in any of the samples.



CHROMATOGRAM 1. GC/FID SIGNATURE OF SAMPLE SG052



CHROMATOGRAM 2. GC/FID SIGNATURE OF SAMPLE SG015

The GC/FID chromatogram signatures of the samples revealed late eluting peaks which may represent terpenes, as exemplified by Chromatogram 1, Sample SG052. Terpenes are naturally occurring hydrocarbons exuded by plant. A large late-eluting peak was present in the signature of Sample SG015 which may represent a terpene but could not be identified without further chemical analysis (Chromatogram 2).

Methylene chloride (CH_2Cl_2), trichloroethene (TCE), and tetrachloroethene (PCE) were below their respective detection limits in all the samples collected at the site. 1,1,1-Tetrachloroethane (1,1,1-TCA) was present at a relatively low level in Sample SG034 collected in the residential area east of Madfox Drive. 1,1,1-TCA is a commonly used industrial solvent and a byproduct in biodegradation of other compounds.

The remaining hydrocarbons observed in the Oil and Solvents Disposal Pit Area and the adjacent residential housing area may be naturally occurring and do not suggest a contamination problem in the shallow subsurface of this area. This survey constitutes a baseline for future analysis of samples from the permanent soil vapor probes implanted at the site. It should be noted, however, that isopropyl alcohol was present in soil gas samples collected with the SVPs. The presence of isopropyl alcohol in some soil gas samples was determined to be the result of the specified decontamination procedure, and not a reflection of conditions in the soil vapor at those locations. **ABB Environmental Services** may find it necessary to consider the decontamination procedure when interpreting data collected in the future from these probes.

TABLE 1

SAMPLING DEPTH

SAMPLE	FEET	SAMPLE	FEET
SG001	5.5	SG031	4
SG002	5.5	SG032	3.5
SG003	5.5	SG033	5.5
SG004	5.5	SG034	3
SG005	5.5	SG035	5.5
SG006	5.5	SG036	3.5
SG007	5.5	SG037	3
SG008	3.5	SG038	3
SG009	3	SG039	3
SG010	1 3/4	SG040	3
SG011	2 1/4	SG041	3
SG012	4	SG042	5.5
SG013	3	SG043	3
SG014	4	SG044	3
SG015	5.5	SG045	3
SG016	5.5	SG046	3
SG017	5.5	SG047	3
SG018	5.5	SG048	5.5
SG019	5.5	SG049	3
SG020	5.5	SG050	3
SG021	5.5	SG051	3
SG022	5.5	SG052	4
SG023	3	SG053	3
SG024	3	SG054	3
SG025	5.5	SG055	5.5
SG026	5.5	SG056	3
SG027	5.5	SG057	4
SG028	3.5	SG058	5.5
SG029	5.5	SG059	4
SG030	5.5	SG060	5

TABLE 2

ANALYTE CONCENTRATIONS VIA GC/FID (μg/l)

SAMPLE	MEK	ACETATE	ETHYL BENZENE	MIBK	TOLUENE	N-BUTYL ACETATE	CHLORO-BENZENE	ETHYL-BENZENE	XYLENES	TOTAL FID VOLATILES[1]
SG001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG002	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG004	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG005	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG006	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG007	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG008	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG009	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG011	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.5
SG012	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG013	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG014	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.0
SG015	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	826
SG016	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.8
SG017	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	28
SG018	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG019	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG020	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG021	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG022	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG023	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG024	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG025	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG026	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG027	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	15
SG028	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG029	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG030	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG031	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG032	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG033	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG034	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.3
SG035	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG036	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
SG037	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9
SG038	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG039	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG040	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG041	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5.8
SG042	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.6
SG043	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10
SG044	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG045	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.5
SG046	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	25
SG047	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.7
SG048	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.4
SG049	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG050	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG051	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	42
SG052	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	250
SG053	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG054	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2
SG055	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.9
SG056	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG057	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG058	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4.5
SG059	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG060	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2

MEK = METHYL ETHYL KETONE
MIBK = METHYL ISOBUTYL KETONE

[1]CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

TABLE 2 (cont)

ANALYTE CONCENTRATIONS VIA GC/FID (µg/l)

SAMPLE	MEK	ETHYL ACETATE	BENZENE	MIBK	TOLUENE	N-BUTYL ACETATE	CHLORO-BENZENE	ETHYL-BENZENE	XYLENES	TOTAL FID VOLATILES[1]
FIELD CONTROL SAMPLES										
SG100	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG101	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG102	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG103	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG104	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY DUPLICATE ANALYSES										
SG010	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG010R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG017	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	28
SG017R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	28
SG033	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG033R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG044	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG044R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG048	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.4
SG048R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.2
SG056	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SG056R	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY BLANKS										
BMAJF-1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
BMAJF-2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
BMAJF-3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
BMAJF-4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
BMAJF-5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
BMAJF-6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

MEK = METHYL ETHYL KETONE
MIBK = METHYL ISOBUTYL KETONE

[1]CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

TABLE 3

ANALYTE CONCENTRATIONS VIA GC/ECD (μg/l)

SAMPLE	CH_2Cl_2	TCE	PCE
SG001	<1.0	<0.10	<0.05
SG002	<1.0	<0.10	<0.05
SG003	<1.0	<0.10	<0.05
SG004	<1.0	<0.10	<0.05
SG005	<1.0	<0.10	<0.05
SG006	<1.0	<0.10	<0.05
SG007	<1.0	<0.10	<0.05
SG008	<1.0	<0.10	<0.05
SG009	<1.0	<0.10	<0.05
SG010	<1.0	<0.10	<0.05
SG011	<1.0	<0.10	<0.05
SG012	<1.0	<0.10	<0.05
SG013	<1.0	<0.10	<0.05
SG014	<1.0	<0.10	<0.05
SG015	<1.0	<0.10	<0.05
SG016	<1.0	<0.10	<0.05
SG017	<1.0	<0.10	<0.05
SG018	<1.0	<0.10	<0.05
SG019	<1.0	<0.10	<0.05
SG020	<1.0	<0.10	<0.05
SG021	<1.0	<0.10	<0.05
SG022	<1.0	<0.10	<0.05
SG023	<1.0	<0.10	<0.05
SG024	<1.0	<0.10	<0.05
SG025	<1.0	<0.10	<0.05
SG026	<1.0	<0.10	<0.05
SG027	<1.0	<0.10	<0.05
SG028	<1.0	<0.10	<0.05
SG029	<1.0	<0.10	<0.05
SG030	<1.0	<0.10	<0.05
SG031	<1.0	<0.10	<0.05
SG032	<1.0	<0.10	<0.05
SG033	<1.0	<0.10	<0.05
SG034	<1.0	<0.10	<0.05
SG035	<1.0	<0.10	<0.05
SG036	<1.0	<0.10	<0.05
SG037	<1.0	<0.10	<0.05
SG038	<1.0	<0.10	<0.05
SG039	<1.0	<0.10	<0.05
SG040	<1.0	<0.10	<0.05
SG041	<1.0	<0.10	<0.05
SG042	<1.0	<0.10	<0.05
SG043	<1.0	<0.10	<0.05
SG044	<1.0	<0.10	<0.05
SG045	<1.0	<0.10	<0.05
SG046	<1.0	<0.10	<0.05
SG047	<1.0	<0.10	<0.05
SG048	<1.0	<0.10	<0.05
SG049	<1.0	<0.10	<0.05
SG050	<1.0	<0.10	<0.05
SG051	<1.0	<0.10	<0.05
SG052	<1.0	<0.10	<0.05
SG053	<1.0	<0.10	<0.05
SG054	<1.0	<0.10	<0.05
SG055	<1.0	<0.10	<0.05
SG056	<1.0	<0.10	<0.05
SG057	<1.0	<0.10	<0.05
SG058	<1.0	<0.10	<0.05
SG059	<1.0	<0.10	<0.05
SG060	<1.0	<0.10	<0.05

CH_2Cl_2 = methylene chloride TCE = trichloroethene
PCE = tetrachloroethene

TABLE 3 (cont)

ANALYTE CONCENTRATIONS VIA GC/ECD (μg/l)

SAMPLE	CH_2Cl_2	TCE	PCE
FIELD CONTROL SAMPLES			
SG100	<1.0	<0.10	<0.05
SG101	<1.0	<0.10	<0.05
SG102	<1.0	<0.10	<0.05
SG103	<1.0	<0.10	<0.05
SG104	<1.0	<0.10	<0.05
LABORATORY DUPLICATE ANALYSES			
SG010	<1.0	<0.10	<0.05
SG010R	<1.0	<0.10	<0.05
SG017	<1.0	<0.10	<0.05
SG017R	<1.0	<0.10	<0.05
SG033	<1.0	<0.10	<0.05
SG033R	<1.0	<0.10	<0.05
SG044	<1.0	<0.10	<0.05
SG044R	<1.0	<0.10	<0.05
SG048	<1.0	<0.10	<0.05
SG048R	<1.0	<0.10	<0.05
SG056	<1.0	<0.10	<0.05
SG056R	<1.0	<0.10	<0.05
LABORATORY BLANKS			
BMAJF-1	<1.0	<0.10	<0.05
BMAJF-2	<1.0	<0.10	<0.05
BMAJF-3	<1.0	<0.10	<0.05
BMAJF-4	<1.0	<0.10	<0.05
BMAJF-5	<1.0	<0.10	<0.05
BMAJF-6	<1.0	<0.10	<0.05

CH_2Cl_2 = methylene chloride TCE = trichloroethene
PCE = tetrachloroethene

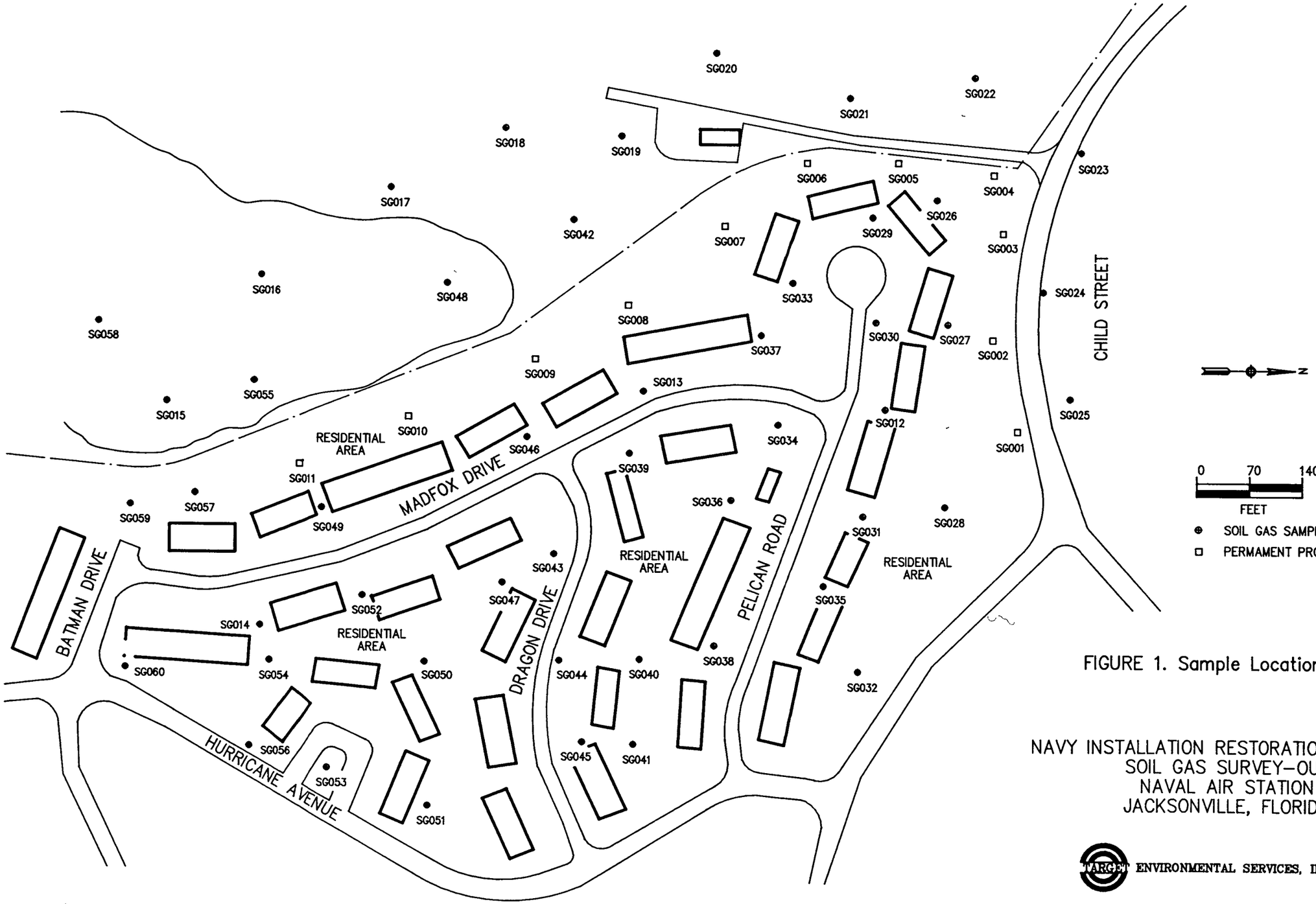


FIGURE 1. Sample Locations

NAVY INSTALLATION RESTORATION PROGRAM
SOIL GAS SURVEY–OU1
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

ENVIRONMENTAL SERVICES, INC.

This map is integral to a written report and should be viewed in that context.

FIGURE 2. Total FID Volatiles
(calc'd µg/l)

NAVY INSTALLATION RESTORATION PROGRAM
SOIL GAS SURVEY–OU1
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

TARGET ENVIRONMENTAL SERVICES, INC.

This map is integral to a written report and should be viewed in that context.